Bull. Natn. Sci. Mus., Tokyo, Ser. A, 18 (3), pp. 121–126, September 22, 1992

Two New Species of the Families Araneidae and Clubionidae (Arachnida, Araneae) from Taiwan[1)]

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Abstract Two new spider species of the families Araneidae and Clubionidae are described from the mountainous areas of Taiwan under the names *Araneus roseomaculatus* sp. nov. and *Clubiona asrevida* sp. nov. The former species resembles *Araneus variegatus* YAGINUMA, 1960, described from Japan. The latter is closely related to *Clubiona diversa* O. PICKARD-CAMBRIDGE, 1862, widely distributed from Europe to East Asia, and seems to belong to the species-group of *Clubiona trivialis*.

Although Taiwan has been known to abound in insects and other terrestrial animals of special interest, the spiders of the island have been very poorly studied. According to the species list of spiders known from Taiwan made by CHU and OKUMA (1975, 1976), about 200 species of spiders were recorded from the island. However, this is much smaller than the estimated number of the spiders really occurring there. From Japan, about 1,200 species of spiders were recorded up to the present. Of these, about 400 species are known from around Tokyo. Judging from the diversity of the geological and climatic conditions, the present author surmises that more than 600 species should occur in this island.

Through the field researches of the zoological expeditions to the high mountains of Taiwan made by the National Science Museum, Tokyo (1989–1991), many specimens of spiders were obtained from various parts of the island. The first paper dealing with the result of identification of these materials was recently published by the present author on a new species of the genus *Xysticus*, Thomisidae (ONO, 1992). This paper presents the second report describing further two new species of spiders of the large and popular genera *Araneus* CLERCK, 1758 (Araneidae), and *Clubiona* LATREILLE, 1804 (Clubionidae). The *Araneus* species is one of the most beautiful orb-weavers. Only three species of the genus *Clubiona* were previously known from Taiwan, while 7 species were described from Iriomote-jima Island, the Ryukyus, about 200 km east of Taiwan (ONO, 1989). The author will commence his study of clubionid spiders of Taiwan with the present paper.

1) This study is supported by the Grants-in-aid No. 01041099 for Field Research of the Monbusho International Scientific Research Programm and No. 04640694 for Scientific Research from the Ministry of Education, Science and Culture, Japan.

All the type specimens of the new species are deposited in the collection of the National Science Museum (Natural History), Tokyo.

The abbreviations used in this paper are as follows: ALE, anterior lateral eye, AME, anterior median eye, PLE, posterior lateral eye, PME, posterior median eye.

Before going further, the author wishes to express his hearty thanks to Prof. Dr. Yau-I CHU and Mr. Chiun-chen KO, Taipei, for kind arrangement of the field researches, to Dr. Shun-Ichi UÉNO, Tokyo, for critically reading the manuscript of this paper, to Prof. Yoshiaki NISHIKAWA, Ibaraki, Prof. Dr. Tsukané YAMASAKI and Dr. Akihiko SHINOHARA, Tokyo, for their collaboration in the field.

Family Araneidae

Genus *Araneus* CLERCK, 1758

Araneus roseomaculatus sp. nov.

(Figs. 1–4)

Description (based on the ♀ holotype; ♂ unknown). *Measurement.* Body length 10.10 mm, prosoma length 4.00 mm, width 3.74 mm, opisthosoma length 8.29 mm, width 8.11 mm; lengths of legs I–IV (in mm) [total length (femur+patella+tibia+metatarsus+tarsus)]: I 17.21 (4.89+2.11+4.21+4.47+1.53), II 14.47 (4.16+1.95+3.37+3.89+1.10), III 9.21 (2.98+1.37+1.84+2.11+1.00), IV 14.12 (4.70+1.82+3.08+3.47+1.05).

Prosoma. Carapace longer than wide, flattened. Eyes: AME>PME>ALE=PLE, ALE/AME 0.86, PLE/PME 0.92, AME–AME/AME–ALE 0.58, PME–PME/PME–PLE 0.25, ALE and PLE close to each other; median ocular area wider than long, wider in front than behind, anterior width / posterior width 1.30, length/width 0.85; clypeus / AME–AME 0.64. Chelicera: promargin of fang furrow with 4 strong teeth, retromargin with 3 teeth. Labium length/width 0.76; sternum length/width 1.22.

Legs. Leg-formula I–II–IV–III. Spiniformation. Femora: I dorsal 1–1–1, prolateral 0–1–1–2, retrolateral 0–0–1–1, II dorsal 1–1–0–0, prolateral 0–1–1, III dorsal 1–0–0; patellae: I–IV dorsal 1 (apical); tibiae: I dorsal 0–0–1, prolateral 1–1–1–1, retrolateral 0–1–1–1, ventral 1–2–1–2–2, II dorsal 0–1–1, prolateral 0–1–1–1, retrolateral 1–0–0, ventral 1–1–1–2, III dorsal 1–1–1, ventral 1–1–1–2, IV dorsal 1–0–0, prolateral 1 (apical), ventral 2 (apical); metatarsi: I–II dorsal 1–0–0, prolateral 1–0–0, retrolateral 0–1–0, I ventral 1–2–2–2, II ventral 2–2–2–2–2, III dorsal 1–0, prolateral 1–0, retrolateral 0–1–0, ventral 2–1–2–2, IV dorsal 1–0–0, prolateral 1–1, retrolateral 0–1–0, ventral 1–1–1–1–1.

Opisthosoma large, slightly longer than wide, without protuberance on the anterior part but with a pair of conspicuous red markings.

Female genitalia (Figs. 3–4). Epigynum with a linguiform scape wide and short, and not removable, distally with a guide pocket.

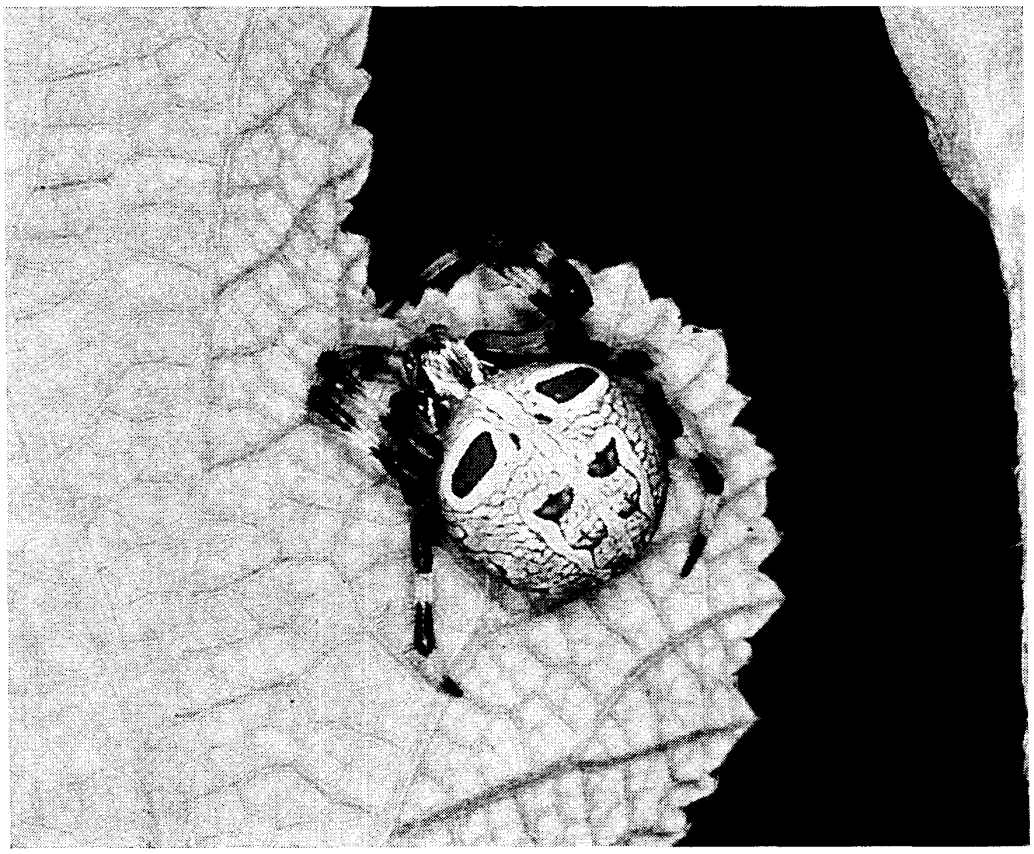
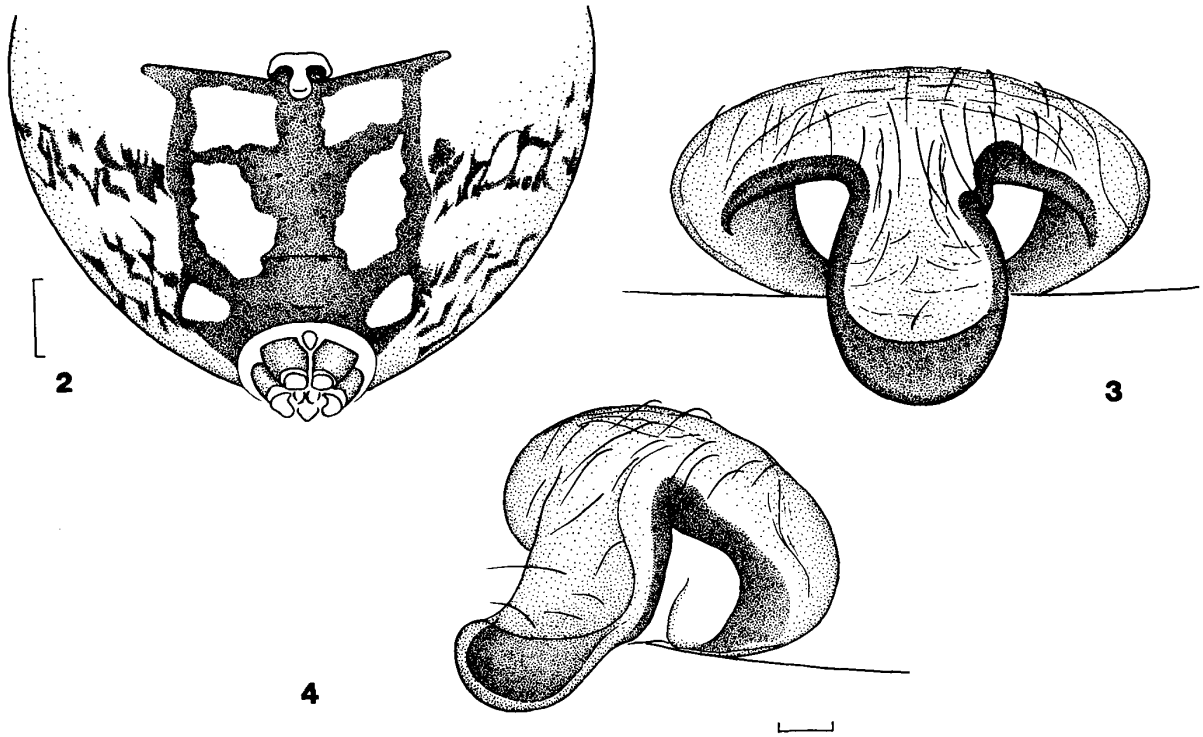


Fig. 1. *Araneus roseomaculatus* sp. nov., female holotype.

Coloration and markings. In alcohol: Carapace yellowish brown with a brown stripe at the middle and a pair of dark brown stripes at the sides. Chelicerae dark brown, distally much darker, maxillae and labium blackish brown with white margins, sternum white, both the sides blackish brown. Legs: femora yellowish white with blackish brown markings at the middle, other segments blackish brown, with wide, yellowish white rings on the metatarsi and tibiae. Femur of palp white, other segments dark brown, tibia with a white ring. Opisthosoma dorsum light beige, with a pair of yellowish brown markings on the anterior part; venter blackish brown with three pairs of white patches (Fig. 2). Coloration of living spider: Prosoma silvery grey, legs blackish with white rings, opisthosoma bright yellow, the pair of markings on the anterior part vivid rose-red marginated by white.

Specimen examined. Holotype: ♀, Mt. Hsinan-shan, south slope, 2,350 m alt., Kaohsing Hsien, Taiwan, 31–X–1981, H. ONO leg. (NSMT–Ar 2912).

Remarks. This species resembles *Araneus variegatus* YAGINUMA, 1960, described from Mt. Kôyasan, Wakayama Prefecture, Japan, but is readily distinguishable from the latter by the coloration and markings of the opisthosoma. The paired red patches on the abdomen are unique and remarkable for identification. The scape of female genitalia of *A. variegatus* is much slenderer and longer than that of *A. roseomaculatus*.



Figs. 2–4. *Araneus roseomaculatus* sp. nov. —— 2. Opisthosoma, ventral view (scale: 1 mm). 3. Epigynum, ventral view. 4. Same, ventrol-lateral view (scale: 0.1 mm).

The shape of the epigynal scape of *Araneus rotundicornis* YAGINUMA, 1972, is short, wide and linguiform and resembles that of this new species. However, the former species has distinct protuberances (humps) on the opisthosoma and the coloration is markedly different from that of *A. roseomaculatus*. The type locality of *A. rotundicornis* is Sapporo, Hokkaido, Japan.

This new spider made an orb web with a retreat thread between the branches of a tree 4 m high in the daytime.

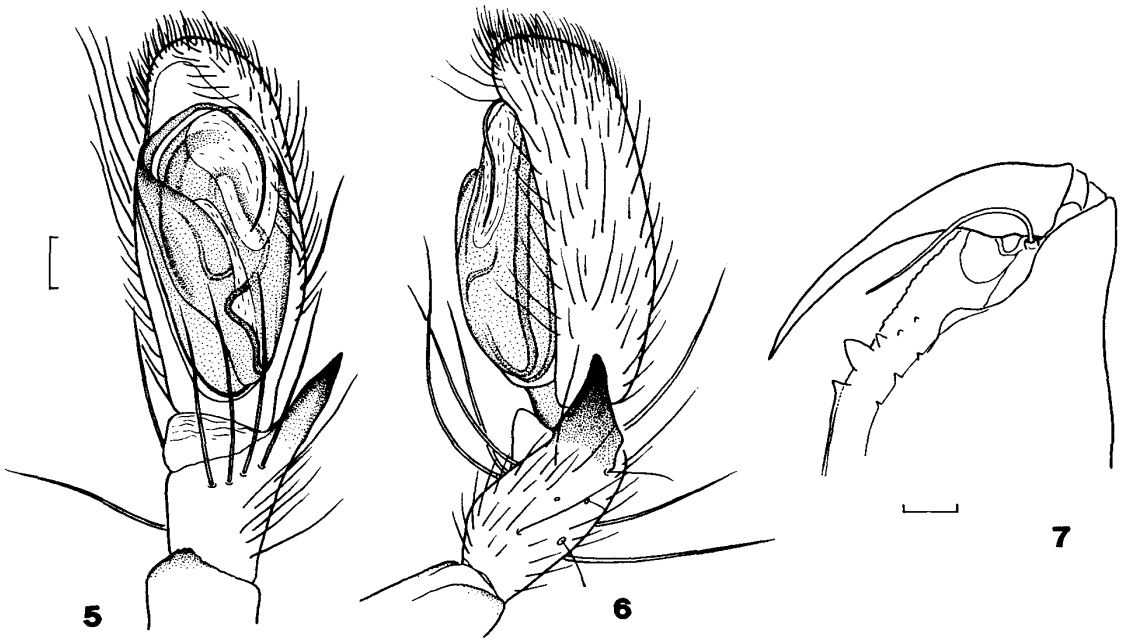
Family Clubionidae

Genus *Clubiona* LATREILLE, 1804

Clubiona asrevida sp. nov.

(Figs. 5–7)

Description (based on the holotype ♂ and the paratype ♂ (in parentheses); ♀ unknown). *Measurement.* Body length 5.85 mm (4.96 mm), prosoma length 2.74 mm (2.28 mm), width 1.93 mm (1.56 mm), opisthosoma length 3.18 mm (2.52 mm), width 1.63 mm (1.41 mm). Lengths of legs I–IV (in mm) [total length (femur+patella+tibia+metatarsus+tarsus)]: I 8.05 (2.28+1.18+2.19+1.59+0.81), II 7.74 (2.22+1.11+2.07+1.56+0.78), III 6.08 (1.78+0.78+1.37+1.56+0.59),



Figs. 5–7. *Clubiona asrevida* sp. nov. —— 5. Male palp, ventral view (scale: 0.1 mm). 6. Same, retrolateral view. 7. Distal part of chelicera, ventral view (scale: 0.1 mm).

IV 8.41 (2.41+1.04+1.89+2.37+0.70).

Prosoma. Lateral eyes slightly larger than median ones; ALE/AME 1.33 (1.38), PLE/PME 1.11 (1.13), AME–AME/AME–ALE 1.14 (1.20), PME–PME/PME–PLE 1.67 (1.46); median ocular area wider than long, length/width 0.68 (0.76), anterior width / posterior width 0.61 (0.71); clypeus / AME–AME 0.50 (0.58). Chelicera long and developed but not strongly curved, promargin of fang furrow with one large and 4 small teeth, retromargin with a wide tooth sclerotized and bluntly edged and 3 small teeth (Fig. 7).

Legs. Leg-formula IV–I–II–III. Spiniformation: Femora: I–IV dorsal 0–1–1–1, I and IV prolateral 0–0–0–1, II–III prolateral 0–0–1–1, I–III retrolateral 0–0–1–1, IV retrolateral 0–0–0–1; patellae: III–IV retrolateral 1; tibiae: I–II ventral 2–2, III–IV pro- and retrolateral 1–1, respectively, III–IV ventral 2–2–1; metatarsi: I ventral 1–0, II ventral 2–0, III–IV prolateral 1–2–2, III retrolateral 1–0–2, ventral 2–0–2, IV retrolateral 1–2–2, ventral 2–1–2.

Male palp (Figs. 5–6). Tibia with long spines, retrolateral apophysis developed and strongly sclerotized, spatulate, distal part blunt. Tarsus long, bulb simple, without distinct tegular apophysis; embolic division simply edged and without apophysis, embolus spiniform, fine and curved, its distal part on membranous conductor.

Coloration and markings. Prosoma light brown, head darker; chelicerae light reddish brown, maxillae and labium brown, sternum yellow; legs and palps yellowish brown. Opisthosoma beige, posteriorly pinkish, venter light yellowish brown. The paratype ♂ is much lighter in coloration.

Specimens examined. Holotype: ♂, paratype: ♂, and 1 juvenile ♀, Mt. Ch'uan-hsing-shan, 1,840 m alt., T'aichung Hsien, Taiwan, 2–III–1991, H. ONO leg. (NSMT–Ar 2238–2239).

Remarks. This new spider is closely related to *Clubiona diversa* O. PICKARD-CAMBRIDGE, 1862, widely distributed from Europe to East Asia, but can be distinguished from the latter species by the shape of the retrolateral apophysis on its palpal tibia and the length of embolus as well as the smaller bulb. The copulatory organ of male palp completely occupies the cymbium of tarsus in *Clubiona diversa* (cf. WIEHLE, 1965, p. 473, figs. 7–8; ROBERTS, 1985, p. 87, fig. 33 d), while the distal one-fifth of cymbium is visible in ventral view of the male palp of this new species. The palp of *C. asrevida* seems slenderer than that of the European spider.

Though the author has never examined any Japanese specimen of *Clubiona diversa*, illustrations given by previous Japanese authors may not correspond to true *C. diversa* (for instance CHIKUNI, 1989, p. 126, fig. 19 p). Previous records of *C. diversa* from Japan should be carefully checked, because the Japanese "*diversa*" seems closer to this Taiwanese new species than to European specimens of true *C. diversa*.

Clubiona subrostrata ZHANG et HU, 1991, recently described from Fujian Province, China, also stands close by this new species. However, the retrolateral tibial apophysis of the male palp of *C. subrostrata* is much wider than that of *C. asrevida*. The new species belongs to the species-group of *Clubiona trivialis* designated by DONDALE and REDNER (1978).

The species name was made by an arbitrary arrangement of letters and has no meaning.

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